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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/550,471	09/01/2006	Elliot Ehrich	2685_3002 US	4421
38421 7590 04/22/2008 ELMORE PATENT LAW GROUP, PC 515 Groton Road Unit 1R Westford, MA 01886				
EXAMINER POLANSKY, GREGG				
ART UNIT		PAPER NUMBER		
1611				
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04/22/2008		PAPER		

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/550,471

Applicant(s)

EHRICH ET AL.

Examiner

Gregg Polansky

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Period for Reply -- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 10 January 2008.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,2,4-8,10-16 and 18-28 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,2,4-8,10-16 and 18-28 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SI/08)
- 4) ☐ Interview Summary (PTO-413)
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____
- Paper No(s)/Mail Date _____

DETAILED ACTION

Status of Claims

1. Applicants' response, filed 1/10/2008, to the Office Action mailed 10/12/2007 is acknowledged. Applicants amended the Specification and Drawings, and presented arguments in response to the Office Action.
2. Applicants' arguments have been fully considered and they are persuasive in part. Rejections and/or objections not reiterated from previous office actions are hereby withdrawn. The following rejections and/or objections are either reiterated or newly applied. They constitute the complete set presently being applied to the instant application.
3. Claims 1, 2, 4-8, 10-16, and 18-28 are pending and presently under consideration.

Priority

4. Applicant's claim for the benefit of a prior-filed application under 35 U.S.C. 119(e) or under 35 U.S.C. 120, 121, or 365(c) is acknowledged. Applicant has not complied with one or more conditions for receiving the benefit of an earlier filing date under 35 U.S.C. 119(e) as follows: The later-filed application must be an application for a patent for an invention which is also disclosed in the prior application (the parent or original nonprovisional application or provisional application). The disclosure of the invention in the parent application and in the later-filed application must be sufficient to comply with

the requirements of the first paragraph of 35 U.S.C. 112. See *Transco Products, Inc. v. Performance Contracting, Inc.*, 38 F.3d 551, 32 USPQ2d 1077 (Fed. Cir. 1994).

The disclosure of the prior-filed applications, Application Nos. 60/366479, 60/366449, 60/354354, 60/366487 and 60/366440, fails to provide adequate support or enablement in the manner provided by the first paragraph of 35 U.S.C. 112 for one or more claims of this application. The prior-filed applications fail to disclose trospium as required by all instant claims.

Claim Rejections - 35 USC § 112

5. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

7. Claims 8, 10-16, and 18-21 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 8 recites the limitation that the composition of Claim 1 "comprises a dry particulate formulation of trospium characterized by a **fine particle fraction** of at least 50%" (emphasis added). The claim fails to disclose the aerodynamic diameter of the particles which comprise at least 50% (by mass) of the composition. Therefore, any particle size will satisfy the limitation of this claim.

Applicants argue the term "fine particle fraction" is "clearly defined on page 4, line 1 of the present specification as 'the mass of the composition that possesses an aerodynamic diameter of less than 3.4 microns as determined with an 8 Stage

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Anderson Cascade Impactor, used according to manufacturer's specifications". Claim 23 fails to define the invention properly.

Although the claim is interpreted in light of the Specification, limitations from the Specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

Regarding Claim 15, the phrase "at least about" is indefinite because it is unclear as to what range is covered by the term "about". The claim lacks clarity as to whether "at least" (minimum) or "about" (broadening limitation, both higher and lower) controls the metes and bounds of the phrase "at least about".

Claim Rejections - 35 USC § 102

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

7. Claims 1, 4, 5, and 22-26 rejected are under 35 U.S.C. 102(b) as being anticipated by Freund et al. (U.S. Patent Application Pub. No. 2001/0008632).

Freund et al. teach aqueous aerosols of *inter alia* anticholinergic agents, including tiotropium chloride and ipratropium bromide (see page 2, paragraphs 20, 21

and 23), and β -sympatico-mimetics, including formoterol and fenoterol (see page 2, paragraphs 36 and 37) for inhalation in the treatment of respiratory passage diseases (see page 1, paragraph 7 and page 3, claim 2). The reference teaches the active ingredients can be used singly or in combination. Freund et al. also teach an active agent concentration range of 10mg/100ml to 20000mg/100ml and a nebuliser delivering 12 microliters of concentrate per operation (see page 3, paragraph 52). Therefore, the dose of active agent would be between 1.2 mcg and 2400 mcg per operation.

It is noted that *In re Best* (195 USPQ 430) and *In re Fitzgerald* (205 USPQ 594) discuss the support of rejections wherein the prior art discloses subject matter, which there is reason to believe includes functions that are newly cited, or is identical to a product instantly claimed. In such a situation the burden is shifted to the applicants to "prove that subject matter to be shown in the prior art does not possess the characteristic relied on" (205 USPQ 594, second column, first full paragraph). There is no requirement that a person of ordinary skill in the art would have recognized the inherent disclosure at the time of invention, but only that the subject matter is in fact inherent in the prior art reference. *Schering Corp. v. Geneva Pharm. Inc.*, 339 F.3d 1373, 1377, 67 USPQ2d 1664, 1668 (Fed. Cir. 2003); see also *Toro Co. v. Deere & Co.*, 355 F.3d 1313, 1320, 69 USPQ2d 1584, 1590 (Fed. Cir. 2004) ("[T]he fact that a characteristic is a necessary feature or result of a prior-art embodiment (that is itself sufficiently described and enabled) is enough for inherent anticipation, even if that fact was unknown at the time of the prior invention"). Also see *SmithKline Beecham Corp. v. Apotex Corp.*, 403 F.3d 1331, 1343-44, 74 USPQ2d 1398, 1406-07 (Fed. Cir. 2005)

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(holding that a prior art patent to an anhydrous form of a compound "inherently" anticipated the claimed hemihydrate form of the compound because practicing the process in the prior art to manufacture the anhydrous compound "inherently results in at least trace amounts of" the claimed hemihydrate even if the prior art did not discuss or recognize the hemihydrate). In the instant application, Claim 1 recites a functional limitation of "effective therapy for at least 10 hours". The instant specification appears to demonstrate that both aqueous and dry powder formulations of trospium are therapeutically effective for at least 10 hours. Thus it appears that a 10 hour effective duration of action of trospium is independent of its formulation and one would anticipate that the aqueous trospium formulation taught by Freund et al. would have a similar therapeutically effective duration of action, absent evidence to the contrary.

8. Claims 1, 2, 4-7 are rejected under 35 U.S.C. 102(e) as being anticipated by Richards et al. (U.S. Patent Application Pub. No. 2003/0158176).

Richards et al. teach anticholinergic (antimuscarinic) agents, including the compound, trospium, are useful for the treatment of acetylcholine-mediated disorders, in particular, the treatment of *inter alia* chronic obstructive pulmonary disease (COPD) and asthma (see page 5, paragraphs 91 and 93). Richards et al. teach the advantageous administration of these agents by inhalation or insufflation in the form of an aerosol or a dry powder (administered by dry powder inhaler (see page 6, paragraphs 103 and 106). The reference discloses clinically effective doses of the anticholinergic agents to be 10 µg to 1000 µg, which encompass the instantly claimed dose range of 200 µg to 800 µg.

See *In re Best* (195 USPQ 430) and *In re Fitzgerald* (205 USPQ 594) as discussed *supra*.

Claim Rejections - 35 USC § 103

9. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

10. Claims 1, 2, 4, 5, 22-26 and 28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Freund et al. (U.S. Patent Application Pub. No. 2001/0008632), in view of Richards et al. (U.S. Patent Application Pub. No. 2003/0158176).

The teachings of Freund et al. are presented *supra*.

Freund et al. does not teach specific respiratory passage diseases.

The teachings of Richards et al. are presented *supra*. In addition to the doses taught by Richards et al. the reference teach that dose depends on many factors, including the potency of the compound, the age and weight of the patient and the severity of the condition (see page 6, paragraph 105). One of ordinary skill in the art would have optimized the dose taught by Freund et al. to maximize the therapeutic effects and minimize the deleterious effects of the active agent.

One of ordinary skill in the art (e.g., a pulmonologist) would have found it obvious to combine these two teachings to treat diseases such as COPD and asthma by local (i.e., inhalation) administration of tropium and an additional agent, such as formoterol. Freund et al. teach the usefulness of tropium and formoterol for treating respiratory passages diseases and Richards et al. teach COPD and asthma as two respiratory

diseases effectively treated by tiotropium. One would have been motivated to administer the active agents via inhalation to directly target the respiratory system, thereby minimizing the amount of active agents administered systemically, thus avoiding excessive systemic absorption and resulting undesirable systemic effects, and to improve upon the known methods of treatment for COPD and asthma.

Applicants argue that Freund et al. do not teach the dose of tiotropium required to achieve 10 hour therapy by inhalation. The Examiner disagrees. See the discussion of *In re Best* (195 USPQ 430) and *In re Fitzgerald* (205 USPQ 594) in the 35 U.S.C. 102 rejection to Freund et al., *supra*. Applicants further argue that “[w]ithout the benefit of the present application, the Examiner has proved no motivation as to why one would pick tiotropium or tiotropium chloride from the list of over 100 *active ingredients* disclosed in paragraphs 0015-0045 of Freund in order to prepare an optimized formulation having a sustained effective therapy for at least 10 hours”. In response, the Examiner directs Applicants to the teachings of Richards et al., which is drawn to treating respiratory diseases such as asthma and COPD by quaternary ammonium compounds effective as anticholinergic agents. Richards et al. teach tiotropium to be an anticholinergic agent and provides ample motivation to the skilled artisan to select tiotropium (one of 4 anticholinergic agents disclosed by Freund et al.) as an active agent in the Freund et al. reference.

11. Claims 1, 2, 4-8, 10-13, 15, 18-28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Freund et al. (U.S. Patent Application Pub. No. 2001/0008632), in view of Richards et al. (U.S. Patent Application Pub. No. 2003/0158176) as applied to

Claim 1, 2, 4, 5, 22-26 and 28 above, and further in view of Bernstein et al. (U.S. Patent Application Pub. No. 2004/0105821 A1).

Bernstein et al. teach particulate sustained release pharmaceutical formulations for inhalation administration. See Abstract. The sustained release dry powder formulations are disclosed to be useful in the treatment of respiratory disease, including *inter alia* asthma and COPD. Further, the sustained release formulation provides local or plasma concentrations at nearly constant values over the intended period of release (for example, up to 2 to 24 hours), allowing patients to take treatments once or twice daily. See page 13, paragraphs 184, 189 and 190. Bernstein et al. teach anticholinergic agents (such as ipratropium bromide) and bronchodilator/sympathimetic agents (such as formoterol) may be formulated by the methods disclosed. See pages 8-9, paragraphs 92 and 123. Although Bernstein et al. do not teach tropium per se, they do teach anticholinergic agents in general. Freund et al. also teach anticholinergic agents can be administered by dry powder formulation, as well as specifically teaching both ipratropium bromide and tropium. One of ordinary skill in the art at the time of the invention would have understood (especially in light of the teaching of Freund et al.) that one known anticholinergic agent (i.e., tropium) could be substituted for another (i.e., ipratropium) with a reasonable expectation of success. The formulations disclosed by the reference utilize spray drying techniques. See page 10, paragraph 148, and page 11, paragraphs 159-162. The aerodynamic diameter of the formulation is adjusted to enable particle deposition by inhalation to the region of interest in the lung. See pages 4-5, paragraphs 44 and 52. Particles taught by Bernstein et al. have a volume average

diameter and volume median diameter of between 1 and 5 microns, and a tap densities ranging from 0.22 to 0.68 g/mL, and at least 50% by weight of the microparticles delivered to the lung is delivered to the central and upper lung; these disclosures satisfy the requirements of instant Claims 8, 9, 11, and 12. See page 5, paragraph 57; page 14, Table 1; and page 15-16, claims 4, 5 and 21. The reference teaches the inclusion of surfactants (e.g., lipids), including phospholipids and bulking agents (e.g., amino acids), including leucine, in the formulations. See page 2, paragraph 14; page 6, paragraph 68; page 10, paragraphs 143 and 144; and pages 15-16, claims 10 and 31. The surfactants comprise less than 10% by weight of the microparticles and 0.1 to 5% of the formulation. See page 7, paragraph 79 and page 12, paragraph 171. The active pharmaceutical agent is present from about 5 to 50 wt %. See page 9, paragraph 138. One would presume the remainder of the formulation (i.e., about 45—90 wt %) would be comprised of the bulking agent (e.g., leucine).

It would have been obvious to one of ordinary skill in the art at the time of the invention to combine the above 3 references to create an effective treatment for respiratory diseases, such as COPD, that was administered by inhalation to target the lungs and reduce undesirable systemic effects, and long lasting so as to allow for once daily administration. The reference to Freund et al. and Richards et al. teach suitable therapeutic agents and routes of administration and Bernstein et al. teach methods for creating sustained release formulations of active agents suitable for treating respiratory conditions, including COPD. One would have been motivated to do so to improve upon the known methods of treatment for these respiratory diseases.

A reference is good not only for what it teaches by direct anticipation but also for what one of ordinary skill in the art might reasonably infer from the teachings. (*In re Opprecht* 12 USPQ 2d 1235, 1236 (Fed Cir. 1989); *In re Bode* 193 USPQ 12 (CCPA) 1976). In light of the forgoing discussion, the Examiner concludes that the subject matter defined by the instant claims would have been obvious within the meaning of 35 USC 103(a). From the teachings of the references, it is apparent that one of ordinary skill in the art would have had a reasonable expectation of success in producing the claimed invention. Therefore, the invention as a whole is *prima facie* obvious to one of ordinary skill in the art at the time the invention was made, as evidenced by the references, especially in the absence of evidence to the contrary.

Conclusion

12. Claims 1, 2, 4-8, 10-16, and 18-28 are rejected.
13. No claims are allowed.
14. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Gregg Polansky whose telephone number is (571)272-9070. The examiner can normally be reached on Mon-Thur 9:30 A.M. - 7:00 P.M. EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Woodward can be reached on (571) 272-8373. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Gregg Polansky/
Examiner, Art Unit 1611

/Ardin Marschel/
Supervisory Patent Examiner, Art Unit 1614